REMARKS

In view of the above amendments and the following remarks, reconsideration and further examination are requested.

The specification has been objected to as failing to conform to the guidelines for a specification set forth in the M.P.E.P. Therefore, a number of editorial revisions have been made to the specification and abstract. Due to the number of changes made, a substitute specification and abstract have been prepared. No new matter has been added. Enclosed is a marked-up copy of the specification and abstract labeled "**Version with Markings to Show Changes Made**" indicating the changes to the specification and abstract. As a result, withdrawal of this objection is respectfully requested.

In addition, claims 1-10 have been amended to make a number of editorial revisions. These revisions have been made to place the claims in better U.S. form. None of these amendments have been made to narrow the scope of protection of the claims, nor to address issues related to patentability and therefore, these amendments should not be construed as limiting the scope of equivalents of the claimed features offered by the Doctrine of Equivalents. Enclosed is a marked-up copy of claims 1-10 labeled "**Version With Markings to Show Changes Made**" showing the changes.

Claim 1-3 and 7-10 have been rejected under 35 U.S.C. §102(b) as being anticipated by Herron (US 5,677,196). Claims 4-6 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Herron in view of Kraus (US 6,198,869).

These rejections are respectfully traversed and submitted to be inapplicable to claims for the following reasons.

Claim 1 is patentable over Herron, previously relied upon in the above-mentioned rejections, since claim 1 recites a method for exciting and determining a luminescence in an analyte sample which is located in contact with a waveguiding layer of an optical layer waveguide, the method including, in part, generating the luminescence by non-evanescent excitation in a volume of the analyte sample as luminescence radiation. Herron fails to disclose or suggest

generating luminescence by non-evanescent excitation in a volume of an analyte sample as recited in claim 1.

Herron discloses an apparatus and method for multi-analyte homogeneous fluoro-immunoassays. The apparatus and methods are based on evanescent light principles capable of detecting one or more analytes at concentrations lower than pico-molar. The overall configuration of the apparatus is such that fluorescence-emitting tracer molecules bound to a waveguide surface of a waveguide 122, which is part of a biosensor 120, are excited by an evanescent field penetrating into an adjacent solution from a light beam generated by a light source 100 propagated within in the waveguide 122. A light detection means 150 is used to detect the fluorescent light emitted from the biosensor 120. (See column 1, lines 21-31, column 3, lines 47-51, column 5, line 63 - column 6, line 39 and Figures 1 and 2). As discussed above, Herron clearly relies on evanescent field excitation of luminescence instead of volume excitation. Therefore, it is apparent that Herron fails to disclose or suggest generating luminescence by non-evanescent excitation in a volume of an analyte sample as luminescence radiation. As a result, Herron fails to disclose or suggest the invention as recited in claim 1.

Further, in section 5 on page 6 of the Office Action, the obviousness rejection states that Kraus discloses diffractive output couplings. However, Kraus also fails to provide any suggestion of the above-discussed feature of claim 1.

As for claim 4, it is patentable over Herron and Kraus for the same reasons as set forth above in support of claim 1. That is, claim 4, like above claim 1, recites, in part, generating luminescence by non-evanescent excitation in a volume of an analyte sample as luminescence radiation, which feature is not disclosed or suggested in Herron or Kraus.

Claim 8 is also patentable over Herron, since claim 8 recites an apparatus having, in part, one of an electric energy source operable to generate an electric field, the electric energy source having electrodes, and an optical energy source operable to emit excitation radiation, wherein the electrodes of the electric energy source are located in direct contact with an analyte sample, and the excitation radiation of the optical energy source is directed directly onto the analyte sample at an inclined angle or a right angle, or a reservoir containing a chemical which excites a

chemiluminescence in contact with the analyte sample. Herron fails to disclose or suggest either an electric energy source or an optical energy source as recited in claim 8.

As discussed above with respect to claim 1, Herron discloses a light source 100. The light source is further disclosed as being an argon laser, a laser diode or any other laser or high intensity light source. (See column 5, line 65 - column 6, line 7). Therefore, it is apparent that the light source 100 does not correspond to the electric energy source as recited in claim 8.

Further, Herron discloses that light emitted from the light source 100 is directed to an end 124 of the waveguide 122 on which analytes are in contact with. (See column 6, lines 16-31 and Figure 1). Since the light from the light source 100 is directed to the end 124 of the waveguide 122 instead being either directed directly onto the analyte at an inclined angle or a right angle, or onto a reservoir containing a chemical which excites a chemiluminescence in contact with the analyte sample, it is apparent that the light from the light source 100 also does not correspond to the optical energy source recited in claim 8.

As a result, Herron fails to disclose or suggest the present invention as recited in claim 8.

Again, in section 5 on page 6 of the Office Action, the obviousness rejection indicates that Kraus discloses diffractive output couplings. However, Kraus also fails to provide any suggestion of the above-discussed features of claim 8.

Claim 10 is also patentable over Herron, since claim 10 recites a sensor platform having, in part, a tight sealing layer located on a waveguiding layer, the tight sealing layer having, at least in a subregion of excitation radiation, a cutout having an open top or a closed top and connected to an inflow channel and outflow channel, for an analytical sample, the cutout having a depth at least corresponding to a depth of penetration of an evanescent field of luminescence light guided in an planar optical layer waveguide, wherein the tight sealing layer comprises a material which, at least on a bearing surface at least in the depth of penetration of the evanescent field of the luminescence light guided in the planar optical layer waveguide, is transparent to the luminescence light. Herron fails to disclose or suggest a tight sealing layer as recited in claim 10.

Herron discloses a biosensor 500 that has a waveguide 504 located between a side wall 512 with a number of wells 600, 602, 604 and 606 located therein and a side wall 511, a bottom

wall 517 and a sealing rear wall 518. (<u>See</u> column 11, lines 15-42 and Figures 5A - 6). However, it is apparent that none of the walls correspond to the tight sealing layer recited in claim 10, since none of the walls are disclosed or suggested as comprising a material which, at least on a bearing surface at least in a depth of penetration of an evanescent field of luminescence light guided in the waveguide 504, is transparent to the luminescence light. As a result, Herron fails to disclose or suggest the present invention as recited in claim 10. Further, Kraus also fails to provide any suggestion of the above-discussed feature of claim 10.

Because of the above mentioned distinctions, it is believed clear that claims 1-10 are allowable over Herron and Kraus. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 1-10. Therefore, it is submitted that claims 1-10 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

Gerd MAROWSKY et al.

By: David M. Ovedovitz
David M. Ovedovitz
Registration No. 45,336
Attorney for Applicants

DMO/jmj
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
May 14, 2003

Version with Markings to Show Changes Made

1. (Amended) A method for exciting and determining a luminescence in an analyte sample which is located in contact with [the] a waveguiding layer of an optical layer waveguide, said method comprising: [wherein]

generating the luminescence [is generated] by non-evanescent excitation in [the] a volume of the analyte sample as luminescence radiation[, and];

guiding the luminescence radiation generated in [the] an immediate proximity of [the] a surface of the waveguiding layer [is conducted] to [the] a measuring device [and determined] after the luminescence radiation penetrates the [penetrating said] waveguiding layer; and

measuring the luminescence radiation with the measuring device.

2. (Amended) The method as claimed in claim 1, wherein said generating of the luminescence radiation comprises generating the luminescence radiation [is generated] one of electrically, chemically, and [or] by optical excitation of radiation.

3. (Amended) The method as claimed in claim 1, wherein [use is made as] the optical layer waveguide [of] is a planar waveguide with outcoupling elements for the luminescence [light] radiation.

4. (Amended) [The] A method [as claimed in claim 1, wherein use is made of a sensor platform which has a one- or two-dimensional arrangement of at least two waveguides with diffractive outcoupling elements] for exciting and determining a luminescence in an analyte sample which is located in contact with at least two waveguides with diffractive outcoupling elements of a sensor platform which has a one-dimensional arrangement or a two-dimensional arrangement of the at least two waveguides, said method comprising:

generating the luminescence by non-evanescent excitation in a volume of the analyte sample as luminescence radiation;

guiding the luminescence radiation generated in an immediate proximity of a surface of waveguiding layers of the at least two waveguides to a measuring device after the luminescence radiation penetrates the waveguiding layer; and

measuring the luminescence radiation with the measuring device.

5. (Amended) The method as claimed in claim 4, wherein the sensor platform is covered with a second layer which contains cutouts for holding [an] the analyte sample in a [the] region of the guided luminescence [light] radiation.

6. (Amended) The method as claimed in claim 3, wherein the optical layer waveguide contains one or more diffractive elements as the outcoupling elements for coupling out the luminescence radiation, and the analyte sample is arranged one of upstream of [or] and between [a plurality] at least two of the outcoupling elements.

7. (Amended) The method as claimed in claim 2, wherein said generating of the luminescence radiation comprises generating the luminescence radiation by the optical excitation of radiation, the excitation radiation of the optical excitation of radiation [is] being directed onto the analyte sample from [the opposite] a side of the waveguiding layer opposite to a side of the waveguiding layer where said guiding of the luminescence radiation occurs by a planar waveguide.

8. (Amended) A device for measuring luminescence generated in an analyte sample by excitation radiation, said device comprising:

[a) an] at least one optical layer waveguide [with] comprising a transparent substrate and a waveguiding layer, said waveguiding layer adapted to have an analyte sample located in contact therewith;

[b) an analyte sample which is located in contact with the waveguiding layer;]

[c)] one of an electric energy source operable to generate an electric field, said electric energy source having electrodes, and an [or] optical energy source [which is] operable to emit excitation radiation, wherein said [arranged such that the] electrodes of [the] said electric energy source are located in direct contact with the analyte sample, [or] and the excitation radiation of [the] said optical energy source is directed directly onto the analyte sample at an inclined angle or a right angle, or a reservoir containing a chemical which excites a chemiluminescence in contact with the analyte sample; and

[d)] an optoelectronic detection unit [for measuring the] operable to measure luminescence radiation generated by the action of [an] the electric field or the excitation radiation.

9. (Amended) The device as claimed in claim 8, wherein [the] said at least one optical layer waveguide is a plurality of optical layer waveguides, [a) are] said plurality of optical layer waveguides being planar waveguides which have at least one outcoupling element for coupling out the luminescence radiation.

10. (Amended) A sensor platform [composed of] comprising:

a planar optical layer waveguide[,] comprising:

a transparent substrate, [and]

a waveguiding layer, [the waveguide having]

at least [an] one outcoupling element [for coupling] operable to couple out excitation radiation, and [on whose waveguiding layer there is located]

a [further tightly] tight sealing layer located on said waveguiding layer, said tight sealing layer having, [which has,] at least in a subregion of the excitation radiation, a cutout having an open [at the] top[,] or a [cutout which is] closed [at the] top and connected [via] to an inflow channel and outflow channel, for an analytical sample, said cutout having [whose] a depth [corresponds] at least corresponding to [the] a depth of penetration of [the] an evanescent field of [the] luminescence light guided in [the] said planar optical layer waveguide, [and] wherein [the]

said tight sealing layer [consists of] comprises a material which, at least on [the] a bearing surface at least in the depth of penetration of the evanescent field of the luminescence light guided in [the] said planar optical layer waveguide, is transparent to [this] the luminescence light, and

[the] said at least one outcoupling element [or the outcoupling elements being] is completely covered by [the] said material of [the] said tight sealing layer at least in [the] an outcoupling region of the luminescence radiation.